

MEMORANDUM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD • CENTRAL VALLEY REGION

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To: Ron Ott
CALFED CT

From: Chris Poe
Environ. Spec.

DATE: 15 August 1996

SIGNATURE: Chris Poe

Subject: **REQUESTED REVIEW**

Sorry I am so tardy with this. Several comments. I added another category called "unknowns" to the Parameters of Concern section. What I have in mind here is "toxicity" testing as measured by standardized bioassays with ambient water. If the toxicity appears significant, follow-up studies can be undertaken to determine chemicals and their sources. Identification of the chemical(s) allows one to estimate aquatic half life, fate and by literature review toxicity to local organisms of concern. Much of our new information about chemicals of concern have come through this approach. I'm not sure where the approach fits in but want to mention it now so that it does not get lost.

In evaluating "water quality actions and affected parameters" handout I marked parameters that I thought might be improved by the action. The exception was Action 21 as noted below.

Other comments.

1. Does this mean that the reused water would free up "new" water for use as dilution flows? If so, my guess is that the new water would also be quickly used for agriculture resulting in no net improvement in instream water quality.
2. If this means reenforcing levees with dredge spoil from either within Delta or outside then would likely increase local metal, nitrate and salt concentrations. Effect would be most pronounced in back sloughs with their smaller volumes of flushing flows.

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Parameters of Concern and their Effect on Ecosystem Water Quality

Parameter	Effect of Parameter			Source of Parameter	Affected Biota	Geographical Area of Concern
	Fish & Aquatic	Wildlife and Habitat	Plant			
METALS						
Cadmium	med	low		rivers IMM, CS 120		DIS Keweenaw Reservoir
Chromium	med			rivers, non-urban runoff		
Copper	high			rivers, non-urban runoff		DIS Keweenaw R.
Lead	high			urban & non-urban runoff IMM		
Mercury	high	med		rivers	long lived fish	Lower Saginaw Delta and S.E. Bay
Molybdenum	low					
Nickel	low			rivers		
Selenium	high	low		rivers, point sources	Fish	Saginaw Bay & Delta
Silver	med			POTWs		Saginaw Bay
ZINC	high			IMM	Algae, zooplankton	Upper Saginaw
Arsenic						

Active metals

Major inorganic IMM

Other Saginaw

ARSENIC

OTHER	Fish + Aquatic	wildlife	Plants	Source	Affected biota.	Geographic area of concern.
Arsenic	med			rivers, non-urban runoff		
Pathogens	med	low				
DO	high			POTW discharges, wet weather urban runoff	Fish mostly but all biota to some extent	San Joaquin R @ Rough and Ready Is
pH	low			mine drainage		
Temperature	high			Ag drainage dam releases	All Aquatic biota but spawning fish in particular	Slut, San Joaquin RWA
Salinity (TDS & EC)	high	med	high	ag drainage, seawater intrusion, urban runoff		
Chloride	low					
Sodium			med			
Suspended Solids	high					
Unknown	high		med	urban, non urban	All levels of food chain	throughout Central Valley and Delta

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ORGANICS	Food Response	Wildlife	Wetlands	Source	Affected Biota	Geographic area of concern
Pesticides (herbicides, fungicides, insecticides)	high			ag drainage, urban runoff	sensitive invertebrates (fish food)	Central Valley and Delta
Petroleum Related	high	med	low	stormwater runoff, industrial & municipal		
Other Organics						
	low			mainw as	moluscs	harbors/ marinas (mainly in Delta)
NUTRIENTS						
Nitrogen (other than Ammonia)	high	low	med	POTWs, ag drainage, urban runoff	beneficial to algae and plants. Mostly causes low D.O	San Joaquin River off Rough and Ready Island
Ammonia	high			POTWs, ag drainage, urban runoff, Dairies	harmful fish	Port of Stockton, Sacramento tributaries receiving dairy waste
Phosphorous	high	low	med	POTWs, ag drainage, urban runoff		unknown.

D-032704

Proposed CALFED Water Quality Actions and Affected Parameters that Impact Ecosystem Water Quality

		AFFECTED PARAMETERS																								
ACTION	BENEFIT	METALS										ORGANICS			NUTRIENTS			OTHER								
		Metals	Cadmium	Chromium	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Pesticides (Insecticides, Herbicides, etc.)	Petroleum Related	Other Organics	Nitrogen (other than Ammonia)	Ammonia	Phosphorous	Arsenic	Dissolved Oxygen (D.O.)	Pathogens	pH	Temperature	Salinity (TDS, EC)	Chloride	Sodium	Suspended Solids (SS)
1. Expand and extend existing programs to provide incentives for pollution source control on agricultural lands.	Improved instream and Delta water quality.								X		X															
2. Establish incentives for retirement of lands with the most severe drainage problems and where cost effective.	Improved instream and Delta water quality, reduces demand for irrigation water.								+															X		
3. Manage drainage timing to reduce in-stream impacts of water quality.	Reduces the concentration of pollutants entering and its tributaries during low flow periods and allows better coordination of discharges and dilution flows.		X																							
4. Construct wetlands to treat upstream wastewater effluent and Delta agricultural drainage.	Improves Delta water quality by allowing some filtration and reduction in biological oxygen demand to result from constructed wetland treatment.		X																							
5. Increase enforcement of source control regulations for agricultural drainage to moderately reduce leachate conc. and vol., restrict spray programs adjacent to waterways, reduce runoff vol., reduce concerns of pollutants in runoff.	Reduces in-Delta and tributary surface water concentrations of pesticides (herbicides, fungicides, fungicides), fertilizers, concentrated mineral salts, and microbial agents from agricultural drainage.								+		X															
6. Coordinate following or retirement of agricultural lands with severe costly drainage problems with water supply management actions.	Reduces volume of drainage water and constituent pollutant contributions to Delta and tributary surface waters.										+															
7. Treat agricultural drainage to remove pollutants, to either be reused or used as part of a localized drainage management practice in coordination with management of drainage timing.	Provides additional diversion flows for improving the quality of receiving waters in Delta and to Delta tributaries.										+															
Net SWR about 300 MCM/yr																										
(1)																										

Proposed CALFED water Quality Actions and Affected Parameters that Impact Ecosystem Water Quality

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ACTION	BENEFIT	METALS										ORGANICS			NUTRIENTS			OTHER								
		Metals	Cadmium	Chromium	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Pesticides (Insecticides, Herbicides, etc.)	Petroleum Related	Other Organics	Nitrogen (other than Ammonia)	Ammonia	Phosphorous	Artesian	Dissolved Oxygen (D.O.)	Pathogens	pH	Temperature	Salinity (TDS, EC)	Chloride	Sodium	Suspended Solids (SS)
15. Increase enforcement of source control regulations for urban and industrial runoff.	Enforcement of economic penalties can result in improved management practices that can improve tributary and Delta water quality.											X	X													
16. Implement urban wastewater reclamation programs to develop additional water supply.	Can improve Delta and San Joaquin River and export water quality depending on reclamation activity.											X							X							
17. Implement moderate on-site mine drainage remediation measures developed in site specific studies at the Walker Mine, Iron Mountain Mine, Muddickoff Diggins, Lewiston Mine, and Pease Mine sites, and other priority sites.	Reduces future tributary and Delta heavy metals loading.																									
18. Encourage management of land uses to protect water quality.	Preserves riparian and aquatic habitat, reduces sedimentation, improves Delta water quality.																									
19. Study and implement actions to reduce effects of salinity in the San Joaquin River, to maintain water levels and circulation in the south Delta, and to reduce recycled salt load to the San Joaquin Valley.	Delta manages flow circulation, increase water stages for the south Delta, improve San Joaquin River and south Delta water quality.																									
20. Restore riverine channel features in the San Joaquin River upstream of the Delta, including instabilities.	Improves water quality and water supply reliability from the Sacramento River and its tributaries. Improves riparian, water temperatures. Improves wildlife habitat.																									

Proposed CALFED Water Quality Actions and Affected Parameters that Impact Ecosystem Water Quality

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		Metals	Cadmium	Chromium	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Pesticides (Insecticides, Herbicides, etc.)	Petroleum Related	Other Organics	Nitrogen (other than Ammonia)	Ammonia	Phosphorus	Arsenic	Dissolved Oxygen (D.O.)	Pathogens	pH	Temperature	Salinity (TDS, EC)	Chloride	Sodium	Suspended Solids (SS)
21. Implement a comprehensive Delta Long-Term Protection Plan at a moderate level	Reduces vulnerability of Delta water quality to salinity intrusion. Reduces vulnerability of Delta ecosystem functions to salinity intrusion and inundation	+													+	+							+			
	(2)																									